GOODWE

COMMERCIAL & INDUSTRIAL SMART SOLAR SOLUTIONS

GoodWe-C&I-20211211-EN-V5.0. Information may be subject to change without notice during product improving.

We, the Smart Energy Innovator

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www.goodwe.com

50% oversizing

50% DC Input Oversizing Ratio

15% overloading

15% AC Output Overloading Ratio

Max Efficiency 99%

Modular Design

Arc-Fault Circuit-Interrupter

PLC 2.0

Second Generation of Power Line Communication

String Level Monitoring

UPS

UPS-Level Switching

BOOST YOUR POWER & PROFIT

12-136 kW

SDT G2 Series
2-MPPT, Three-Phase

SMT Series
3-MPPT, Three-Phase

MT Series
4-MPPT, Three-Phase

HT Series
12-MPPT, Three-Phase

BTC Series
AC Retrofit, Three-Phase

100kWp Solar Power Plant Solution

Project Information

Project Location: Munich / GERMANY
PV Panel: 350 Wp Monocrystalline
Inverter: GW30K-MT GoodWe three phase commercial inverter
Installed DC Capacity: 288 pcs x 0.35 kWp = 100.8 kWp
Installed Rated AC Capacity: 3 pcs x 30 kW = 90 kW
DC / AC Ratio: 1.12

* The GoodWe SMT series inverter features a 30-50% DC oversizing capability. In that project 12% DC oversizing applied considering the strong level of irradiation of Germany.

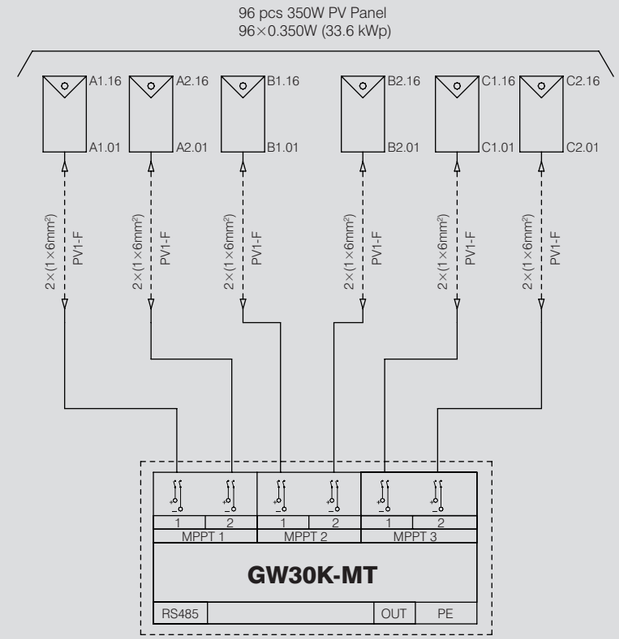
Project Components

No.	Material	Description	Quantity
1	PV Panel	350 Wp Monocrystalline	288
2	Inverter	GoodWe GW30K-MT	3
3	Construction Material	Rooftop Supporting System, Preferably Aluminum	1 Package
4	DC Cable	1x6 mm^2	1,250 mt.
5	AC Cable	5x16 mm^2	150 mt.
6	Comm. Cable	RS485	100 mt.
7	AC Board	3 Leakage Current Protection, 3 Sub Breaker, 1 SPD, 1 Main Switch	1
8	Datalogger	EzLogger Pro (with RS485 com. Method)	1

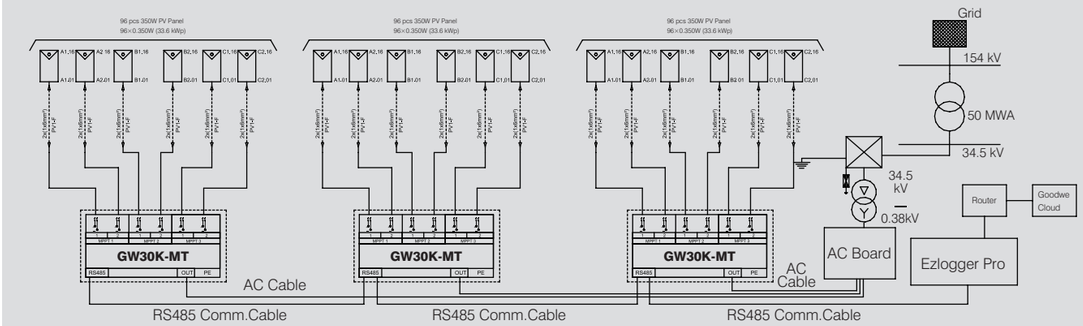
PV Panel Main Features

Maximum Power (Pmax)	350 Wp
Maximum Power Voltage (Vmp)	39.1 V
Maximum Power Current (Imp)	8.94 A
Open-circuit Voltage (Voc)	47.5 V
Size & Weight	1956×992×40 mm 26.5 kg

Cabling & Connections Diagram



* Connection diagram. Each string is connected with 16 PV Panels. The total capacity is 6 string x 16 = 96 pcs.



* The GoodWe Ezlogger Pro features 3 communication inputs per inverter. Each communication port can support up to 20 inverters. In total, 60 inverters can be connected.
* The Max. effective RS485 distance is 1000m for EzloggerPro.
* EzloggerPro is able to perform string level monitoring.

PV System Efficiency Report

Grid-Connected System: Main Results

Project : **100kW_Germany**

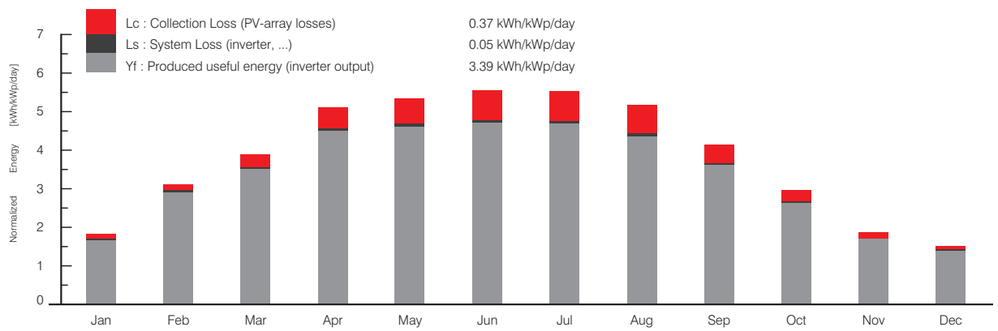
Simulation Variant : **100kW_Germany**

Main System Parameters		**No 3D Scene Defined, No Shadings**		
PV Field Orientation	Tilt	38°	Azimuth	0°
PV Modules	Model	JKM 350M-72-V	Pnom	350 Wp
PV Array	No. of Modules	288	Pnom Total	**101 kWp**
Inverter	Model	GW30K-MT	Pnom	30.0 kW ac
Inverter Pack	No.of Units	3.0	Pnom Total	**90.0 kW ac**
User's Needs	Unlimited Load (Grid)			

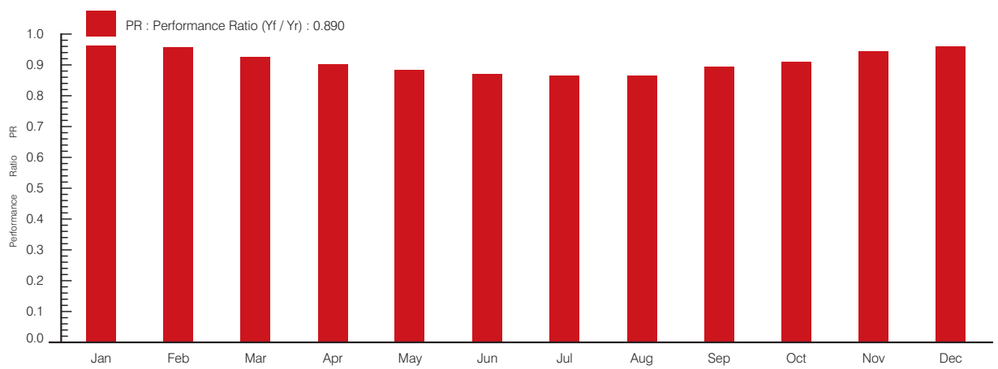
Main Simulation Results

System Production	**Produced Energy**	**124.9 MWh/year**	Specific Prod.	1239 kWh/kWp/year
	Performance Ratio PR	88.97%		

Normalized productions (per installed kWp): Nominal power 101 kWp



Performance Ratio PR



* This report illustrates how the DC oversizing of this installation contributes to increase the total production. If we had followed a 1:1 DC/AC ratio arrangement, the total production would have been 10% lower.

1MWp Solar Power Plant Solution

Project Information

Project Location: Munich / GERMANY
PV Panel: 350 Wp Monocrystalline
Inverter: GW80K-MT GoodWe three phase commercial inverter
Installed DC Capacity: 2880 pcs x 0.35 kWp = 1008 kWp
Installed Rated AC Capacity: 12 pcs x 80 kW = 960 kW
DC / AC Ratio: 1.05

* The GoodWe MT series inverter features a 30-50% DC oversizing capability. In that project 5% DC oversizing applied considering the strong level of irradiation of Germany.

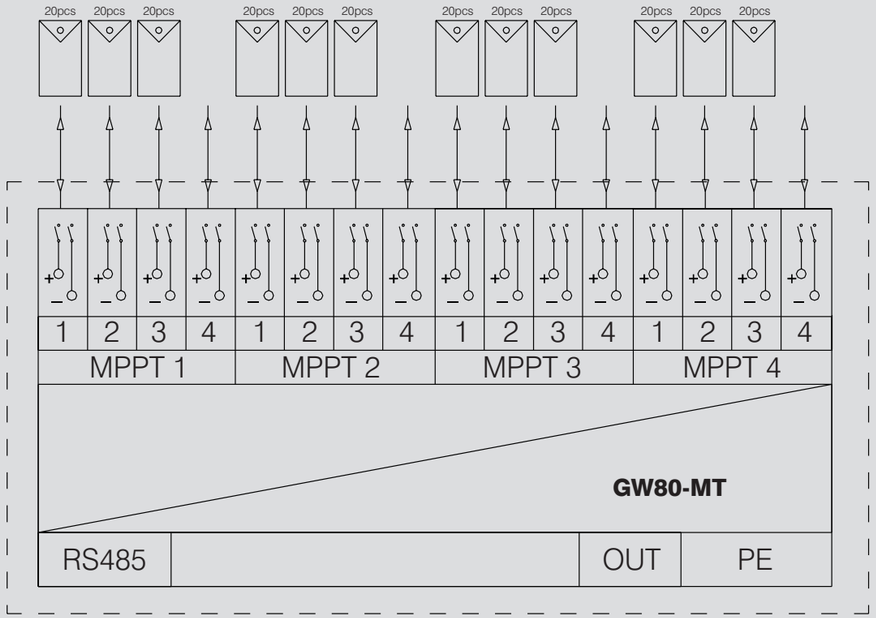
Project Components

No.	Material	Description	Quantity
1	PV Panel	350 Wp Monocrystal	2,880
2	Inverter	GoodWe GW80K-MT	12
3	Construction Material	Rooftop Supporting System, Preferably Aluminum	1 Package
4	DC Cable	1x6 mm^2	13,000 mt.
5	AC Cable	5x35 mm^2	3,000 mt.
6	Comm. Cable	RS485	200 mt.
7	AC Board	4 Leakage Current Protection, 4 Sub Breaker, 1 SPD, 1 Main Switch	3
8	HV Building	Transformer, AC Main Board, Protection Cells	1
9	Datalogger	EzLogger Pro (with RS485 com. Method)	1

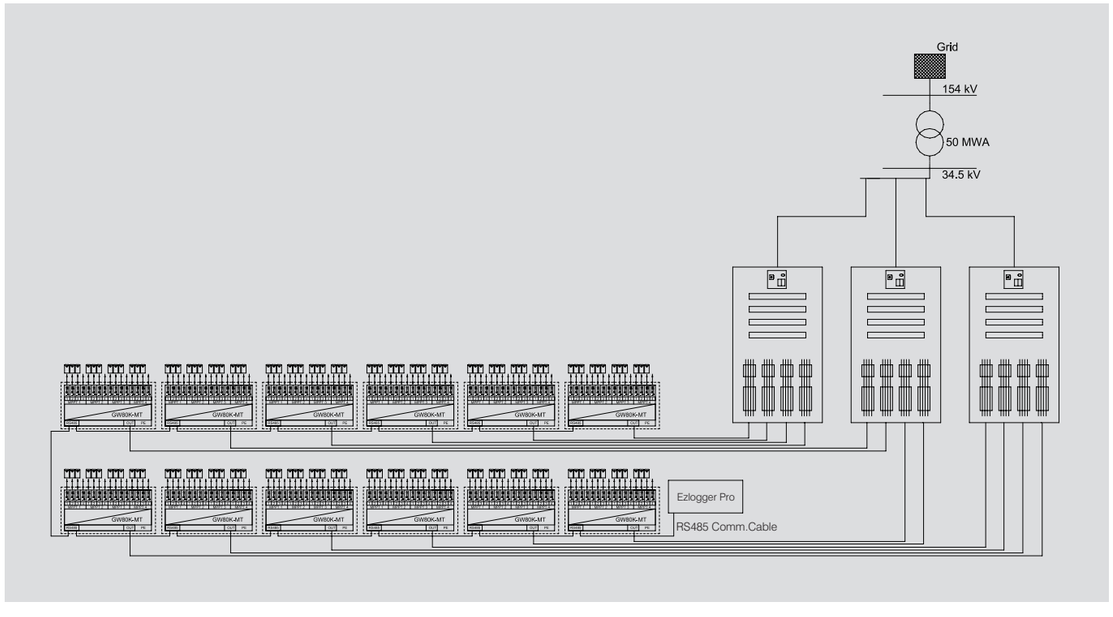
PV Panel Main Features

Maximum Power (Pmax)	350 Wp
Maximum Power Voltage (Vmp)	39.1 V
Maximum Power Current (Imp)	8.94 A
Open-circuit Voltage (Voc)	47.5 V
Size & Weight	1956×992×40 mm 26.5 kg

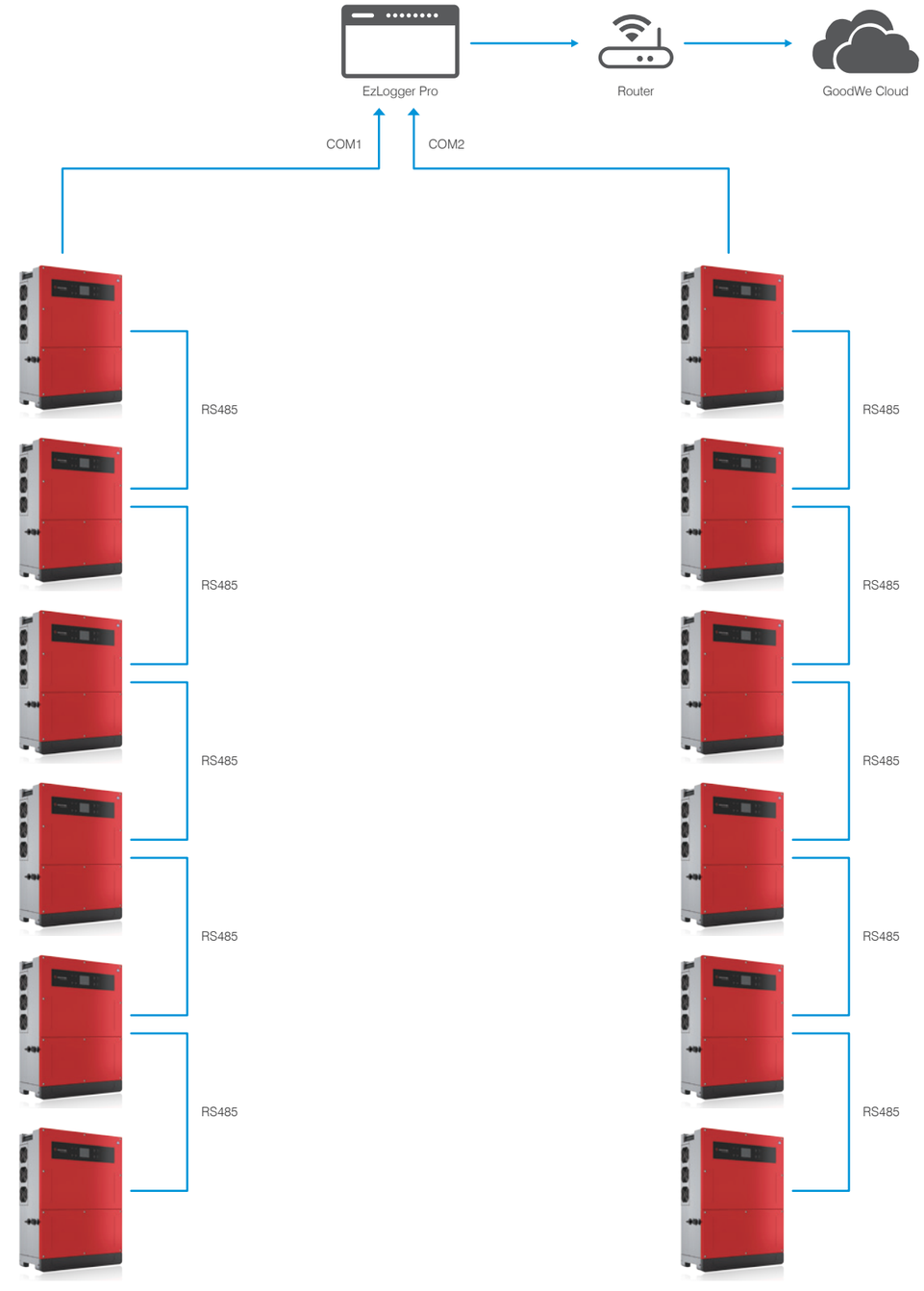
Cabling & Connections Diagram



* Connection diagram. Each string is connected with 20 PV Panels. Total project size: 12 string x 20 = 240 pcs. To reach a higher voltage, we left one DC input on each MPPT unused, instead, more PV panels are connected to the remaining 3 DC inputs.



Communication (RS485) connection diagram.



* The GoodWe Ezlogger Pro features 3 communication inputs per inverter. Each communication port can support up to 20 inverters, achieving a total capacity of 60 inverters that can be connected.
* The Max. effective RS485 distance is 1000m for EzloggerPro.
* EzloggerPro can perform string level monitoring.

PV System Efficiency Report

Grid-Connected System: Main Results

Project : **1MW_Germany**

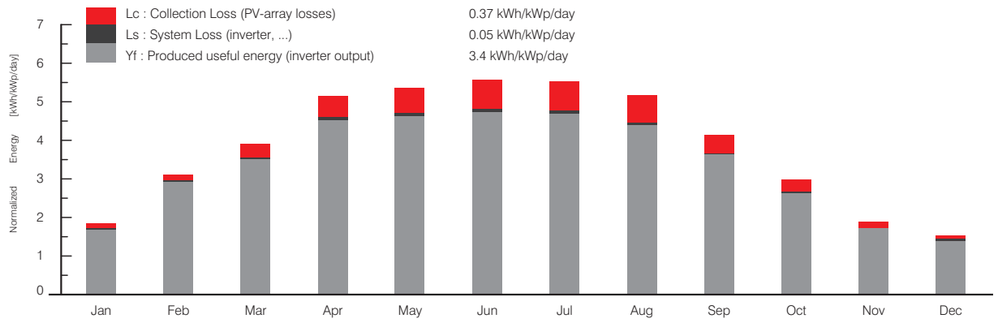
Simulation Variant : **1MW_Germany**

Main System Parameters	System Type	**No 3D Scene Defined, No Shadings**		
PV Field Orientation	Tilt	38°	Azimuth	0°
PV Modules	Model	JKM 350M-72-V	Pnom	350 Wp
PV Array	No. of Modules	2880	Pnom Total	**1008 kWp**
Inverter	Model	GW80K-MT	Pnom	80.0 kW ac
Inverter Pack	No.of Units	12.0	Pnom Total	**960 kW ac**
User's Needs	Unlimited Load (Grid)			

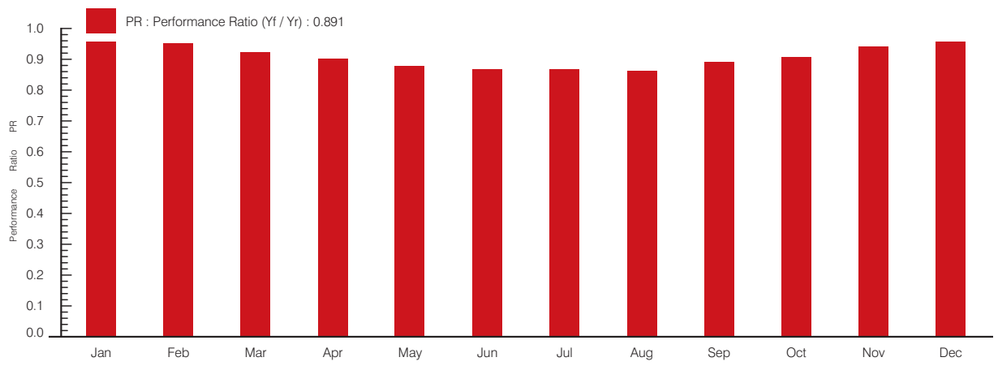
Main Simulation Results

System Production	**Produced Energy**	**1250 MWh/year**	Specific Prod.	1240 kWh/kWp/year
	Performance Ratio PR	89.07%		

Normalized productions (per installed kWp): Nominal power 1008 kWp



Performance Ratio PR



* This report shows the total energy produced less all cumulative losses. This project achieved 5% of DC oversizing.
* The GW80K-MT can support 50% DC oversizing.

5MWp Solar Power Plant Solution

Project Information

Project Location: Munich / GERMANY
PV Panel: 430 Wp Bifacial
Inverter: GW100K-HT GoodWe three phase commercial inverter (400V Output)
Installed DC Capacity: 15200 pcs x 0.43 kWp = 6536 kWp
Installed Rated AC Capacity: 50 pcs x 100 kW = 5000 kW
DC / AC Ratio: 1.30

* GoodWe HT series inverter has 30-50% DC oversize ability. In that project 30% DC oversize applied considering the strong level of irradiation of Germany.

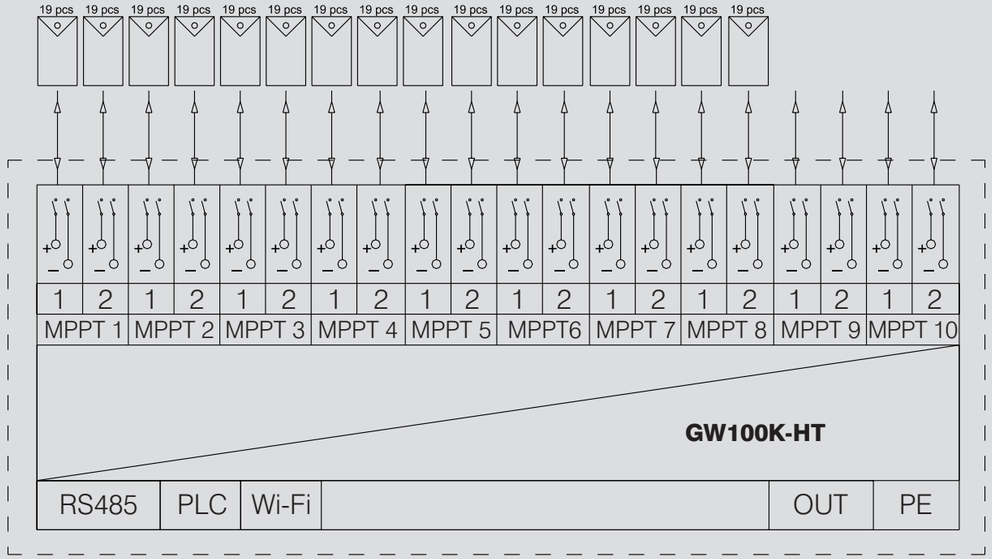
Project Components

No.	Material	Description	Quantity
1	PV Panel	430 Wp Monocrystalline	15,200
2	Inverter	GoodWe GW100K-HT	50
3	Construction Material	Rooftop Supporting System, preferably aluminum	1 Package
4	DC Cable	1x6 mm^2	65,000 mt.
5	AC Cable	4x35 mm^2	153,000 mt.
6	AC Board	5 leakage current protection, 5 Sub Breaker, 1 SPD, 1 Main switch	16
7	HV Building	Transformer, AC Main Board, Protection cells	1

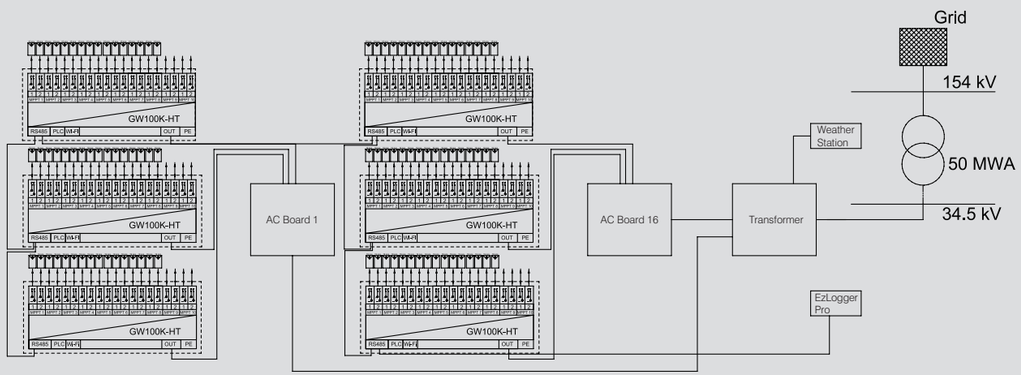
PV Panel Main Features

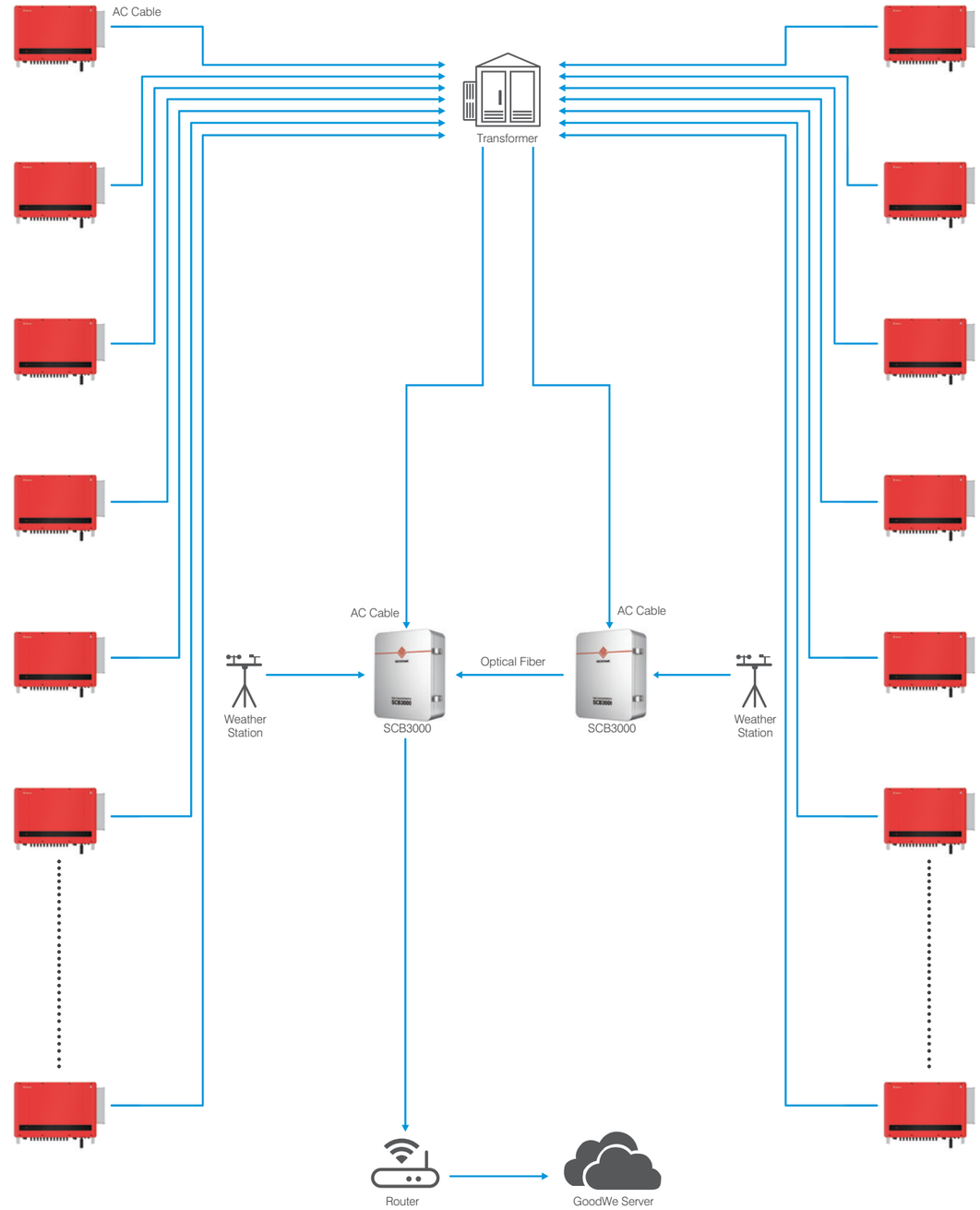
Maximum Power (Pmax)	430 Wp
Maximum Power Voltage (Vmp)	41.20 V
Maximum Power Current (Imp)	10.4 A
Open-circuit Voltage (Voc)	49.40 V
Size & Weight	2131×1052×35 mm 29.5 kg

Cabling & Connections Diagram



* Illustration of connection diagram. To get higher yield we implied 19 pcs of PV Panels to 16 strings. There are 304 PV Panels installed in total per inverter, DC input power is 130.7 kWp. DC/AC ratio is 1.3.





* There are Ezlogger Pro and PLC board located inside of SCB3000 box. This communication box can support up to 60 inverters. For using more than 60 inverters, we can connect all SCB3000 boxes with Optical Fiber.

PV System Efficiency Report

Grid-Connected System: Main Results

Project : **5MW Project**

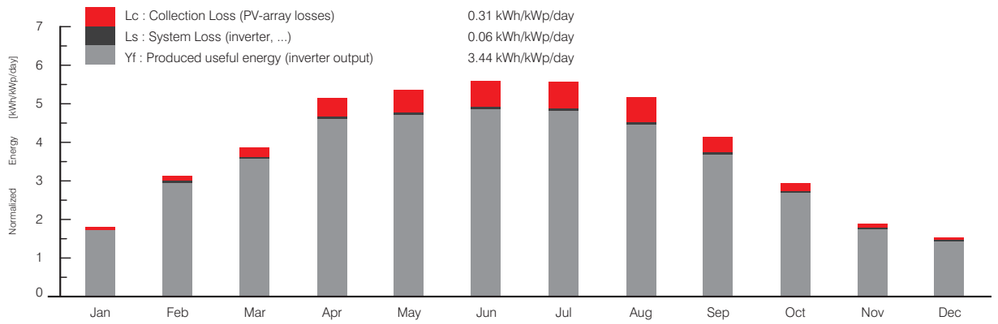
Simulation Variant : **New simulation variant**

Main System Parameters				
System Type	**No 3D Scene Defined, No Shadings**			
PV Field Orientation	Tilt	37°	Azimuth	0°
PV Modules	Model	LR4-72 HBD 430 M	Pnom	430 Wp
PV Array	No. of Modules	15200	Pnom Total	**6536 kWp**
Inverter	Model	GW100K-HT	Pnom	100 kW ac
Inverter Pack	No.of Units	50.0	Pnom Total	**5000 kW ac**
User's Needs	Unlimited Load (Grid)			

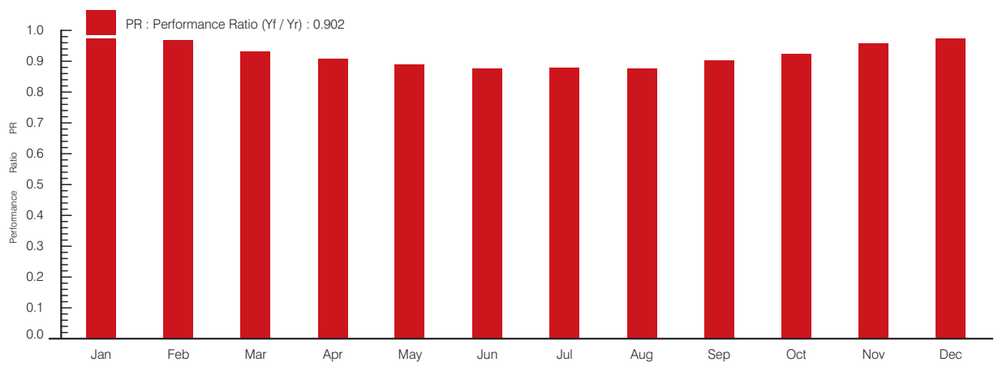
Main Simulation Results

System Production	**Produced Energy**	**8216 MWh/year**	Specific Prod.	1257 kWh/kWp/year
	Performance Ratio PR	90.22 %		

Normalized productions (per installed kWp): Nominal power 6536 kWp



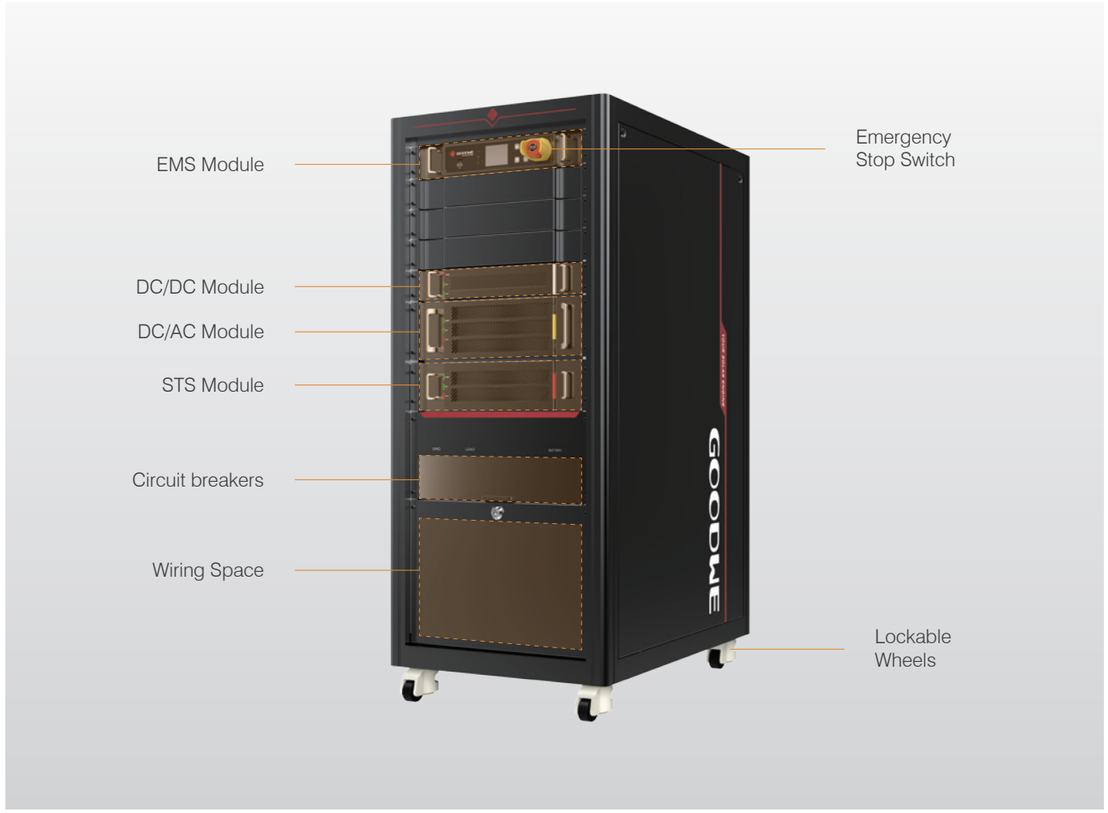
Performance Ratio PR



* This report shows that bifacial PV Panels produce more energy under good irradiation, and has more PR (Performance Ratio) than traditional systems.

* GW100K-HT can support 50% DC oversizing.

BTC Series



Modular design, quick plug & play

100% unbalanced output

UPS-level switching

Built-in remote shutdown function

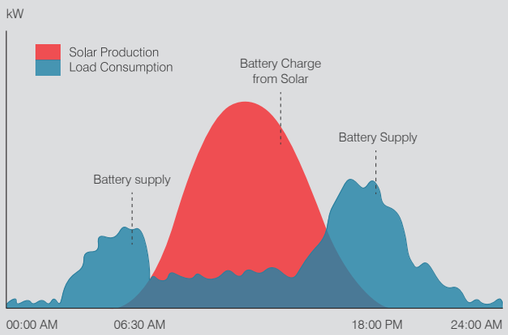
10% continuous AC overloading when backup

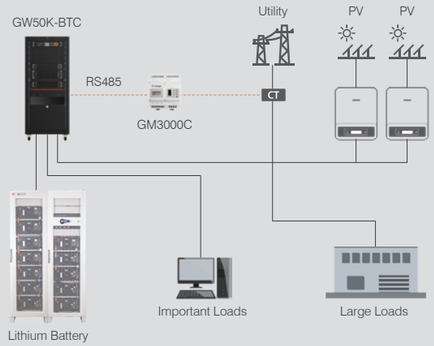
Adjustable active, reactive power and power factor

GoodWe BTC Series is a three-phase, AC retrofit inverter suitable for peak-shaving and can be connected with high-voltage batteries ranging from 200 to 865V. It follows a simple, Plug & Play modular design consisting of four sections (DC/DC, DC/AC, STS & EMS modules). It can switch to backup mode in less than 10ms and ensures continuous power supply for critical loads. It does not require perfect balance when operating, allowing for each phase to supply power to the loads. individually. The active, reactive power and power factor of this inverters is fully adjustable, which makes it suitable for on-grid application It offers 10% continuous AC overloading on backup side for maximum power output and remote shutdown function for system safety.

Self-Use Solution

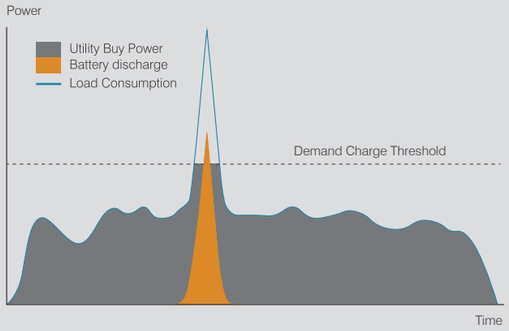
The exceed solar power is stored in battery instead of exporting to public grid, and battery discharge to loads in priority if solar power is lower.

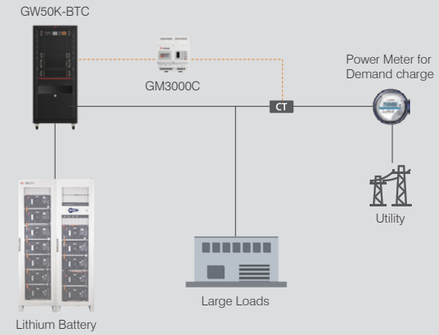




Peak-Shaving Solution

Reserve battery power for peak loads to save on bills.





Time of Use + Self-Use Solution

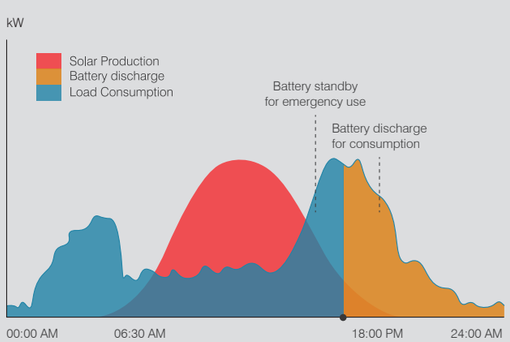
Installing a battery just large enough to store the electricity necessary to avoid pulling energy from the grid, allows you to avoid purchasing energy from your utility during these expensive "peak" hours.

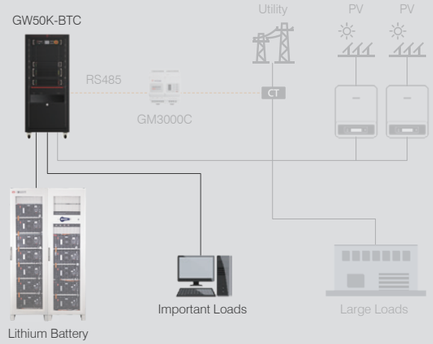
Peak-Shaving + Backup Use

Battery could be fully charged and reserve for emergency use during blackout or discharge to shave peak demands.

Backup Use Solution

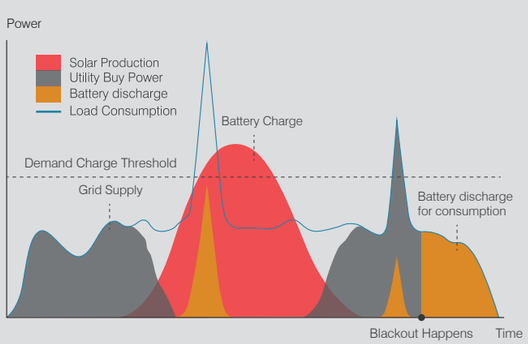
Battery could be fully charged and reserve for emergency use during blackout.

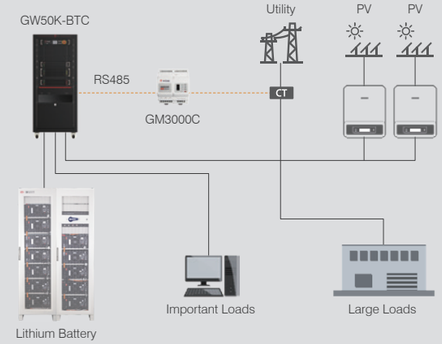




Peak Saving + Backup + Self-Use

The solar production supply consumers in priority and charge battery with exceeded power instead of exporting to public grid, and battery discharge only when peak consumption happens or during blackout for peak-shaving or emergency power supplement.



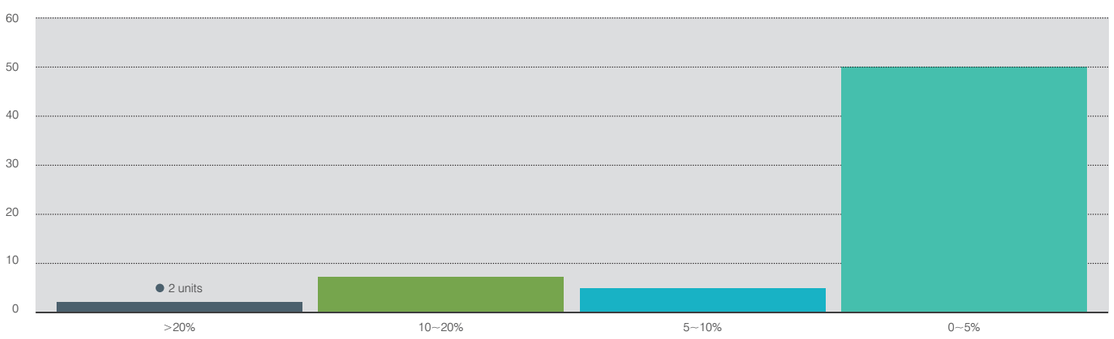


Smart Energy Management System

The Smart Energy Management System (SEMS) of GoodWe is an open protocol monitoring platform. It is designed to help operators to monitor a diverse range of PV plants operating at different locations simultaneously. SEMS carries extensive data processing, including the production of customized charts. Its system of notifications and maintenance functions helps the operators of PV assets to manage the generation of energy efficiently and comfortably, contributing to higher system yields.

String Level Monitoring

Deviation Analysis of Inverters



The high deviation rate indicates problems of the PV system. SEMS is able to select inverters with high deviation rate. Then by diagnosing the current of each string, users can check the corresponding panels and related installation components to find the root cause of the deviation.

>20% | 10~20% | 5~10% | 0~5%

Inverter	Deviation Rate (%)	String Power (W)					
		String 1	String 2	String 3	String 4	String 5	String 6
1NB26	57.74	3618.12	3626.51	4049.023	3579.04	3678.52	3961.61
1NB52	57.75	3599.15	3596.02	3865.846	3528.8	3594.32	4124.26

Carousel Display of All Power Plants

Dynamic carousel display of all the plants under your account.

Smart Report Generation

Report Generation & Customized Data Analysis

Precise and comprehensive detection & evaluation of plant data

The content and design of the reports can be adjusted to suit individual requirements. In addition to the standard report, a report generator is also available.

Multilingual System

SEMS portal is a multilingual site. It offers as many as nine languages, including English, Germany, Dutch, Spanish, Portuguese, Czech, Turkish, Korean, Arabic, Italian, Polish, French, Russian and Japanese. With the popularity of GoodWe inverters all around the world, more language versions of SEMS will be available.

Intelligent Warning and Troubleshooting

Lower O&M Cost:

Full visibility of system performance & remote troubleshooting

Optical Fiber Ring Solution

Maintaining a stable data transfer across long distances ranks high among the priorities. GoodWe has come up with a solution based on the integration of an optical fiber ring, in which the data transfer process and its speed remains undisrupted and reliable even when a communication node is broken. All these benefits make this an optimal solution for C&I scenarios.

Advantages

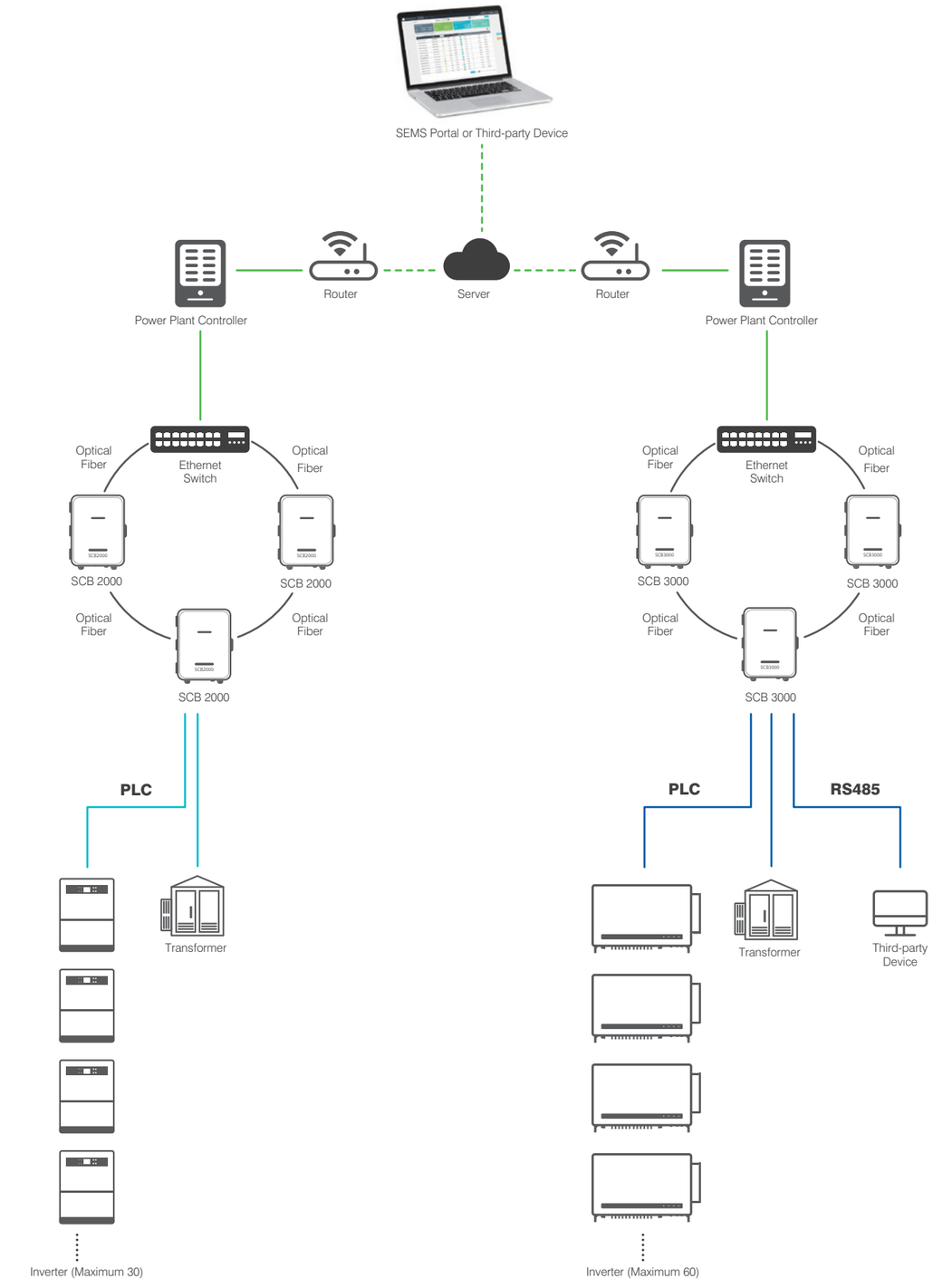
- Provides the most solid basis for a reliable communication
- Long distance data transfer
- Economical

Solution Elements

The integration of the ring solution is possible only with inverters featuring RS485 or Power Line Communications (PLC). This solution is executed through the GoodWe Smart Communication Box 2000 (SCB2000) or Solar Communication Box 3000 (SCB3000).

Solution Design

+ or +



The SCB2000 / SCB3000 establishes communication with the inverter through the PLC.

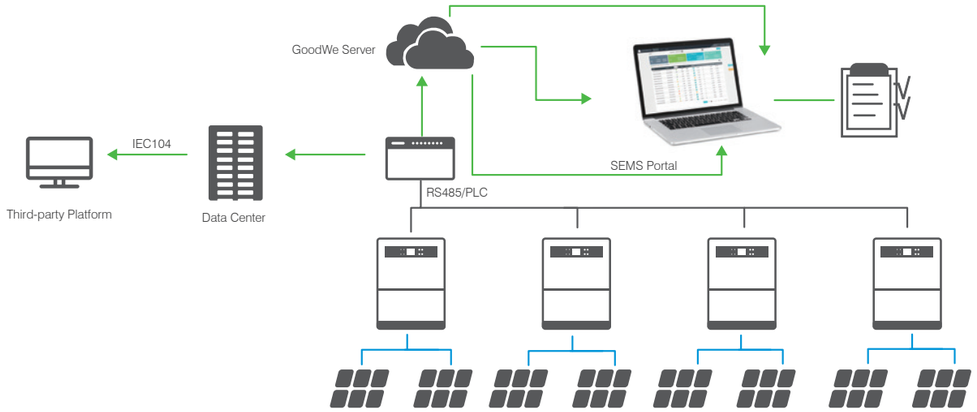
Multi-scenario Monitoring Solution

There are many ways of monitoring a PV system and displaying the data generated. This kind of information helps users to gain a better understanding of the operation of their solar plants. The compatibility of the GoodWe inverters with multiple standard protocols such as SUNSPEC, IEC 104 and Modbus RTU and their adaptability to third-party monitoring and control platform such as SCADA, are one of the many reasons that make them a perfect fit for a great number of C&I scenarios.

Advantages

- Stable data transfer
- Compatible with third party devices & platforms
- Enhanced data security

Solution Design



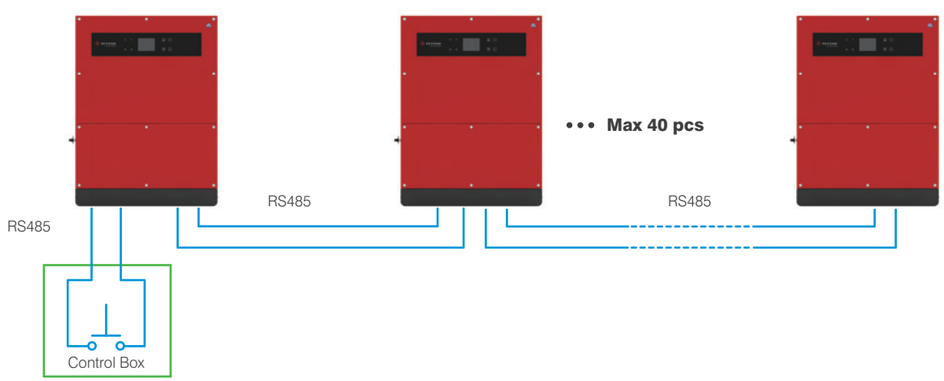
Remote Shutdown Solution

The remote shutdown function is a critical protection primarily aimed at ensuring the integrity of the PV system under situations of extreme emergency, such as fire hazards. In Commercial & Industrial PV systems, it helps operators to enhance and consolidate the system control and maintain the comprehensive safety under challenging environments and conditions. GoodWe is pleased to introduce its Remote Shutdown Solution.

Key Advantages

- Easy Installation
- 1km Range
- Swift Response (≤500ms)

Solution Design



Solar + Diesel Generator Solution

GoodWe is pleased to introduce the Solar + Diesel Generator Solution. In the occurrence of grid failure, a diesel generator can be utilized as an alternative source of energy, supplying the power missing from the public grid and allowing the grid-connected PV systems to keep powering the loads of the system. The addition of a diesel generator brings the extra benefit of maximizing the use of the solar energy, helping as well to effectively reduce the electricity costs. This is an optimal solution for environments characterized by an unreliable grid operation.

Advantages

- Automatic Switch
- Quick Recovery
- Smooth Operation

DEIF Controller Integration

For this kind of scenario, the C&I inverter of the GoodWe MT Series can be configured to coordinate with the DEIF Smart Power Controller Solution in order to automatically switch on/off the diesel generator according to the local circumstances and the user requirements.

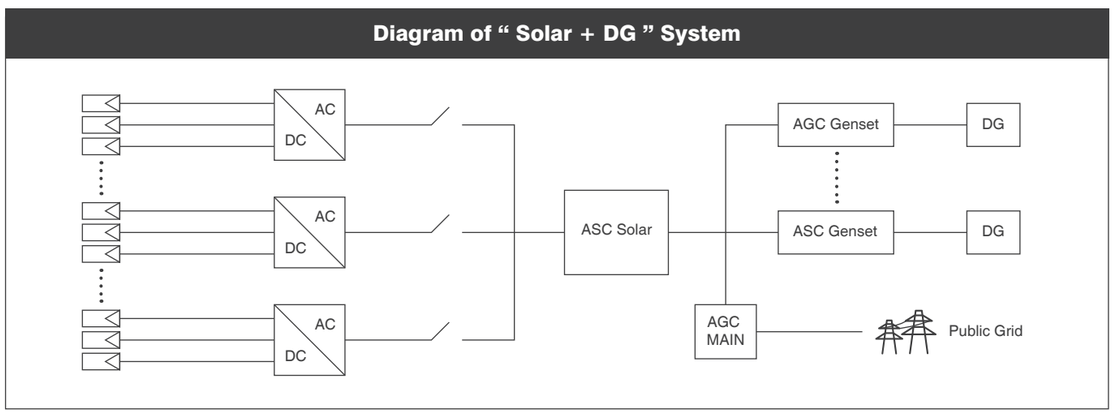
Solution Elements

GoodWe MT Solar Inverter

Diesel Generator

Smart Controller

Solar + DG Integration Scenario



Please approach GoodWe for all questions related to the compatibility of this arrangement with other series of GoodWe inverters. For specific questions related to the controller integration on this scenario, please liaise directly with the manufacturer DEIF.

Export Power Limit Solution

The Export Power Limit function is a critical tool of modern PV systems and its purpose is to help users to enhance and optimize self-consumption, helping them as well to comply with the local grid regulations. GoodWe has made an **Export Power Limit** Solution available to its customers, suitable for Commercial & Industrial projects of maximum capacity of 4.8MW.

Key Advantages

- Convenient installation
- Easy configuration
- Customizable export power limit to either zero or designated value

Solution Elements

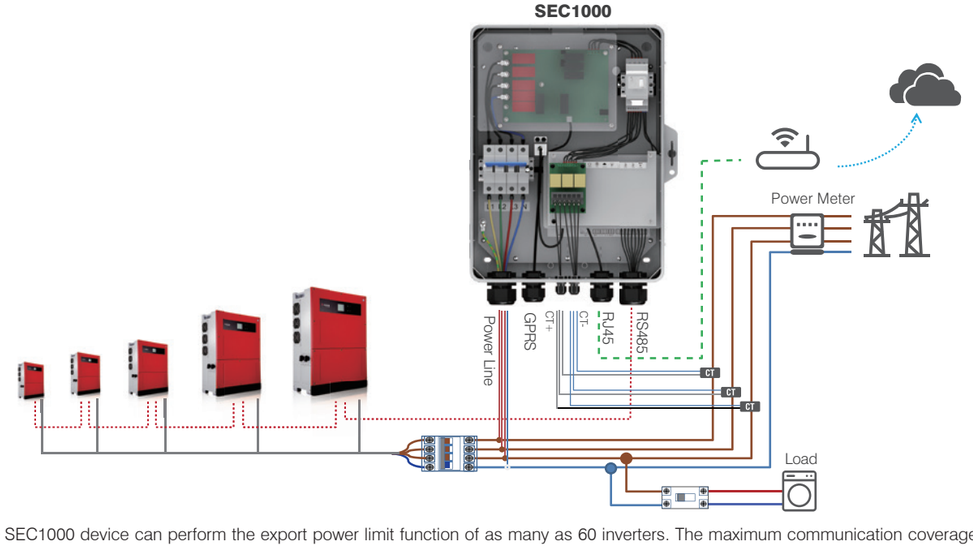
SEC1000

This solution requires the utilization of a GoodWe Smart Energy Controller 1000 (SEC1000). This device executes real-time data collection and analysis. In addition, it also helps to achieve an optimal allocation of the PV system resources.

Additional Benefits

This solution supports the smooth operation of additional functions such as load consumption monitoring. The data generated by the system is accessible free of charge at the GoodWe Smart Energy Management System Portal (SEMS).

Solution Design



A single SEC1000 device can perform the export power limit function of as many as 60 inverters. The maximum communication coverage reaches up to 1000 meters.

Technical Data

SEC1000 / SEC1000S

SCB2000

SCB3000

SDT G2 Series

SMT Series

LV SMT Series

MT Series

LV MT Series

HT Series

BTC Series

200KW **Antonio | Switzerland**

2MW Amsterdam | Netherlands

200KW Coventry | UK

12MW Rotterdam | Netherlands

Global Presence

EMEA

Germany
Netherlands
Turkey
Poland
Russia

EMEA

UK
Italy
Portugal
Spain
France

EMEA

Ukraine
Belgium
South Africa
Greece

LATAM

USA
Mexico
Chile
Brazil
Argentina

APAC

China
India
Vietnam
Australia

APAC

Japan
South Korea
Thailand
Malaysia

*: Please visit GoodWe website for Contact information. **www.goodwe.com**